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| 23474 7590 03/18/2008 FLYNN THIEL BOUTELL & TANIS, P.C. 2026 RAMBLING ROAD KALAMAZOO, MI 49008-1631 | | | | |
| EXAMINER | | | | |
| TALBOT, MICHAEL | | | | |
| ART UNIT | | PAPER NUMBER | | |
| 3722 | | | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/522,399

Applicant(s)

KOECHER, MICHAEL

Examiner

MICHAEL W. TALBOT

Art Unit

3722

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 December 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 and 48-59 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 and 48-59 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 January 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/808)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Objections

1. Claim 58 is objected to because of the following informalities:

The thickness range recited in claim 58 has been written as "0.1 mm to 22". It is best understood that the thickness range should have been written to read --0.1 mm to 2mm-- (i.e. similar to that recited in claim 18).

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-4,7,9,15,16,18,48-53,58 and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foerster (US 3,444,613) in view of Cadden et al. (US 6,732,914). Foerster '613 discloses a cutting tool having a tool shank and a cutting head (col. 1, lines 25-27) made of different materials (col. 1, lines 42-46 and col. 2, lines 3-12) which are integrally connected to one another via a joining layer made of a ductile brazing material (col. 1, line 70 through col. 2, line 2) at joining surfaces and powder particles (col. 1, line 70 through col. 2, line 2) made of temperature resistant material having a lower coefficient of thermal expansion than the brazing material being embedded into the joining layer. Foerster '613 further discloses the tool shank being made of steel, (col. 2, lines 3-12 and lines 66-71) the cutting head being made of carbide (col. 1, lines 42-46) and, the joining layer being made of copper-manganese-nickel with a thickness of 1/32 inch (0.794 mm) and the powder particles being made of nickel (col. 1, line 70 through col. 2, line 2). Foerster '613 lacks the joining layer having a different coefficient of

thermal expansion over its layer thickness such that the coefficient of thermal expansion is lower on the side of the cutting head than on the side of the tool shank.

Cadden et al. '914 shows in Figures 1 and 2 a joining layer (12,13,14) having a different coefficient of thermal expansion over its layer thickness (due to the differing material composition of layers 12,13 and 14 described in col. 3, lines 60 through col. 4, line 12) such that the coefficient of thermal expansion is lower on the side of the cutting head than on the side of the tool shank (due to the joining layer consisting of a composite matrix using powdered tungsten powder dispersed throughout a copper matrix exhibiting closely matching coefficient of thermal expansion at the respective joining layer/adjoining material composition interfaces described in col. 2, line 43 through col. 3, line 16. In order to achieve this, the tungsten powder particles are more closely concentrated, i.e. greater density, at the joining layer interface matching the like-composition material of the cutting head). In view of this teaching of Cadden et al. '914, it would have been obvious to one of ordinary skill in the art to modify the joining layer of Foerster '613 to include a differing coefficient of thermal expansion over its layer thickness being lower on the side of the cutting head than on the side of the tool shank for the purpose of reducing the thermal stresses at the specific material interfaces, thus improving the adjoining connection, by best matching the coefficient of thermal expansion of the layer thickness interface with that of the respective adjoining material compositions.

4. Claims 4-6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foerster (US 3,444,613) in view of Cadden et al. (US 6,732,914), further in view of Guhring (US 4,704,055). Foerster '613 in view of Cadden et al. '914 further discloses a tool shank made of 0.6 to 0.9 percent chromium (chrome being "a part of" the element chromium). Foerster '613 in view of Cadden et al. '914 lacks the tool shank being made from tool steel or a case-hardening steel carburized or nitrided at least on the outer surface.

Guhring '055 shows in Figures 1-1a a cutting tool (1) having a tool shank (2,3) made from tool steel or case-hardening nitriding steel (col. 5, lines 25-29) to form an outer skin hardness. In view of this teaching of Guhring '055, it would have been obvious to one of ordinary skill in the art to manufacturing the tool shank of Foerster '613 in view of Cadden et al. '914 from either a tool steel of a case-hardening nitriding steel as taught by Guhring '055 to provide sufficient elasticity, skin hardness and toughness.

5. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foerster (US 3,444,613) in view of Cadden et al. (US 6,732,914), further in view of Guhring (US 4,704,055). Foerster '613 in view of Cadden et al. '914 lacks the tool shank having at least one helically wound flute and at least one helically wound functionally passage which passes through the joining layer in the direction of the cutting head.

Guhring '055 shows in Figures 1-1a a cutting tool (1) having at least one helically wound flute (21,61) and at least one helically wound functionally passage (4,7) which passes through the joining layer in the direction of the cutting head. In view of this teaching of Guhring '055, it would have been obvious to one of ordinary skill in the art to manufacturing the tool shank of Foerster '613 in view of Cadden et al. '914 to include at least one helically wound flute and at least one helically wound functionally passage as taught by Guhring '055 to provide for chip evacuation and a means for coolant delivery to the cutting tip, thus reducing heat generation and tip wear.

6. Claims 10-12 and 54-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foerster (US 3,444,613) in view of Cadden et al. (US 6,732,914), further in view of Nagel 2002/0009340. Foerster '613 in view of Cadden et al. '914 lacks the joining surface of the cutting head being convexly curved and facing the joining surface of the tool shank which is concavely curved so as to be complementary to one another.

Nagel 2002/0009340 shows in Figures 2-6 a cutting tool (11) having a joining surface of the cutting head (12) being convexly curved (15) and facing the joining surface of the tool shank (13) which is concavely curved (14) so as to be complementary to one another (page 2 through 2, paragraph [0032]). In view of this teaching of Nagel 2002/0009340, it would have been obvious to one of ordinary skill in the art to manufacturing the tool shank and cutting head of Foerster '613 in view of Cadden et al. '914 to include complementary curved joining surfaces as taught by Nagel 2002/0009340 to provide for an increased brazing contact surface area, thus improving the connection weld between the two adjoining pieces.

7. Claims 17 and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foerster (US 3,444,613) in view of Cadden et al. (US 6,732,914). Foerster '613 in view of Cadden et al. '914 discloses the claimed invention except for the thickness of the joining layer corresponding to 10 to 1000 times the diameter of the powder particles. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to select the joining layer corresponding to 10 to 1000 times the diameter of the powder particles for the purpose of reducing the thermal stresses at the specific material interfaces, thus improving the adjoining connection, because it has been held to be within the general skill of a worker in the art to select a known material composition on the basis of its suitability for the intended use as a matter of obvious design choice (col. 2, line 61 through col. 3, line 7).

Response to Arguments

8. Applicant's arguments filed 17 December 2007 have been fully considered but they are not persuasive.

9. Examiner respectfully disagrees with Applicant's arguments that the references do not teach "varying the density of powder particles over the thickness of the joining layer, such that

the coefficient of thermal expansion is lowest on the side of the cutting head as compared to that on the side of the tool shank".

Cadden et al. '914 clearly teaches that the joining layer (12,13,14) can be constructed from varying layers of differing material composition over its layer thickness, resulting in a joining layer having a different coefficient of thermal expansion over its layer thickness. Cadden et al. '914 clearly teaches that the joining layer can consist of a composite matrix using powdered tungsten powder dispersed throughout a copper matrix exhibiting closely matching coefficient of thermal expansion at the respective joining layer/adjoining material composition interfaces described in col. 2, line 43 through col. 3, line 16. Cadden et al. '914 clearly teaches that the tungsten powder particles are more closely concentrated, i.e. greater density, at the joining layer interface matching the like-composition material of the cutting head. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to select a particular joining layer assembly to yield a predictable performance result on the basis of its suitability for the intended use as a matter of obvious design choice.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

12. Any inquiry concerning the content of this communication from the examiner should be directed to Michael W. Talbot, whose telephone number is 571-272-4481. The examiner's office hours are typically 8:30am until 5:00pm, Monday through Friday. The examiner's supervisor, Mrs. Monica S. Carter, may be reached at 571-272-4475.

In order to reduce pendency and avoid potential delays, group 3720 is encouraging FAXing of responses to Office Actions directly into the Group at FAX number 571-273-8300. This practice may be used for filing papers not requiring a fee. It may also be used for filing papers, which require a fee, by applicants who authorize charges to a USPTO deposit account. Please identify Examiner Michael W. Talbot of Art Unit 3722 at the top of your cover sheet.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. W. T./
Examiner, Art Unit 3722
10 March 2008

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/Monica S. Carter/

Supervisory Patent Examiner, Art Unit 3722